



The Blurb



*Newsletter of The Phil-Mont Mobile Radio Club
66 Years of Public Service, 1949 to 2015*

Volume 66 Number 4

www.phil-mont.org

April 2015

***The Board of Directors' Meeting is on the 1st
The General Membership Meeting in on the 8th at the
Willow Grove Giant Supermarket 2nd Floor
Note new Time: Both begin at 7:00***



WA3GM operating on the Auto Train

**WoW! Bob W3NE and Barry K3EUI both submitted
Enlightening and Interesting Articles in this issue!**

This Public Service Announcement from Barry, K3EUI:

It has been verified on the Tuesday evening Digital Education Net (DEN) that some stations using horizontally polarized speakers are unable to copy the digital modes of FLDIGI when transmitted with vertically polarized speakers. It is imperative that all speakers used on 2 meter FM radios use vertically polarized speakers to match the vertical polarization of the RF coming out of the repeater on 147.03 MHz. Cross polarization of speakers results in a large attenuation of the desired signal.

I'm dusting off my Armstrong rotator right now! ed.

Wanted: Pictures of the HF Beam - Mosley Pro 67B
from the Franklin Institute. If you have any please contact WU3I@arri.net Steve, WU3I

NOTE: This is your last *Blurb* if you have not paid your 2015 Dues!

<p><i>The Blurb</i> is published monthly by and for the members of The PHIL-MONT MOBILE RADIO CLUB, Inc., whose purpose is to promote Amateur Radio in general, and Mobile Radio in particular. <i>Copying and quoting</i> is permitted with a credit line. We gladly exchange publications with other amateur radio clubs.</p> <p>Requests should be sent to the Editor: <i>Rick DeVigiliis ND3B@ARRL.net</i></p> <p><i>Subscriptions</i> are available to non-members for \$12, addressed to the Treasurer.</p> <p><i>Labels and mailing: KB3IV</i></p> <p><i>Submissions deadline:</i> All copy must be in the hands of the Editor by the 20th of the previous month.</p>		<p><i>Directors:</i></p> <p><i>N3QV(15)</i> <i>W3RM(15)</i> <i>K3HWG(15)</i> <i>WA3KIO(16)</i> <i>KB2ERL(16)</i> <i>ND3B(16)</i> <i>W3STW(A)</i></p>		<p>Contact Phil-Mont: P.O. Box 404 Warminster, PA 18974 http://www.phil-mont.org Website: Eric N3QV & Andrew KC2PMW</p> <p>For club information: Contact any club officer, or the repeaters listed below. Address or club directory changes and articles for the membership e-mail list should be sent to: KB3IV</p>			
		<p><i>Sunday Morning Net Schedules</i></p> <ul style="list-style-type: none">• 2 Meter/ 70cm Net..... at 0930L on W3QV repeater• 10-on-10 Net at 1000L 28.393 MHz USB (±QRM)• 75 meter Net at 1020L 3.993 MHz LSB• ARES at 2100L on the W3QV repeater					
<p><i>Committees</i></p> <p>Blurb folding: KB3IV & N3GLU Directory: KB3IV Field Day: KC2PMW Fusion Coord: NC3U</p>		<p>Internet: N3QV & KC2PMW Membership: K3HWG Net Control: KB3IV</p>		<p>Program: W3AOK Publicity: W3RM Refreshments: W3AOK Repeater: W3AOK</p>		<p>Scholarship: W3RM Sunshine: N3GLU VE Program: NS3K Welcome: N3UBY Youth: KC2PMW</p>	
<p><i>All visitors are welcome!</i></p> <p>The club meets at 7:00 PM on the <i>second</i> non-holiday Wednesday each month except July and August at Giant Supermarket, 315 York Rd, Willow Grove, PA Maps and directions are available at www.phil-mont.org.</p>							
<p><i>License Examinations</i> are held on the fourth non-holiday Thursday each month at Community Ambulance Association, 1414 E. Butler Pike, Ambler PA 19002 Registration begins at 7:00 P.M. Applicants should contact Jim McCloskey NS3K at 215-275-2979 or jmccloskey@msn.com for the latest information.</p>							
		<p><i>Club Stations W3QV/R: The Jim Spencer Memorial Repeater System</i> Ridge & Port Royal Avenues, Philadelphia, PA <i>Trustee: W3RM</i> 147.03 MHz + PL 91.5 Hz 444.80 MHz + PL 186.2 Hz Reach us on EchoLink through W3QV-R W3AA Trustee: WU3I W3EM: Field Day/special event station Trustee: N3QV</p>					
<p><i>The Officers</i></p> <p><i>President:</i> WA3GM Greg Malone wa3gm@yahoo.com <i>Vice President:</i> W3AOK Bill Popovic w3aok@verizon.net <i>Treas:</i> KB3IV Ed Masarsky kb3iv@comcast.net <i>Secretary:</i> WU3I Steve Hoch steven.hoch@verizon.net</p>							

The Prez Sez ...



AS I sit here on this fine first day of spring, back from the sunny and warm climate of Florida, my thoughts are of warmer weather and flowers in the garden. That is until I looked out the window and see the SNOW falling heavily with at least a three inches on the ground so far... I have the feeling that I am being paid back for trying to escape the winter. Well this should be the LAST one but one never knows.

The trip home on the auto train was uneventful unlike the train that left after us which ended up crashing into a tractor trailer in North Carolina, derailing and leaving 55 people injured. Our thought and prayers are with those folks for a speedy recovery.

My remote operation continued on the way home. Thanks to a fairly decent Wi-Fi connection on the auto train I was able to work the ARRL DX SSB Contest for a while on Sunday's return trip. The club car was the perfect place for this without bothering too many people. Some folks actually stopped by and inquired about the activity. You just can't let a good contest go to waste.

The Phil-Mont general meeting in March was fantastic in both attendance and with our speaker. I would like to thank Sal, NC3U for his fine presentation on the Yaesu Fusion System. Sal did a great job and it looks like the fusion system is really taking off in this area with more machines coming on line every day. In addition to Sal's list the Holmesburg Amateur Radio Club (H.A.R.C.) has received their two fusion repeaters and they will be

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on line soon on 146.685 MHz and 444.9 MHz. Just a reminder that Phil-Mont has a Fusion HT and a Fusion Mobile Rig that can be borrowed from the club so please take advantage of this great mode.

Another note on last months meeting: The board received an email from Jim Day, WA3QED, complimenting and thanking the board for having a great meeting and program. Jim noted that he counted approximately 50 people in attendance. Yes the meeting was very well attended and great to see such a good crowd. As I told Jim the real thanks goes to the members, both old and new, who come out to support Phil-Mont. Your interest and participation in the club and its activities is vital. If anyone has any suggestions on how we can make Phil-Mont better for YOU please see or email any board member and let us know.

The Holmesburg Amateur Radio Club would like to invite all Phil-Mont members as well as anyone else to their next general meeting on Thursday April 16, at 8:00 PM where our own Doug Crompton WA3DSP will be giving his presentation on the All Star network that he presented at our February meeting. If you missed Doug's presentation or would just like some additional info or clarification on something please come to the meeting. H.A.R.C. meets at the Philadelphia Protestant Home, 6401 Martins Mill Rd, Phila., PA (at Tabor Rd)

Great job by the VE Team last Saturday. We had 5 candidates who passed at least one element each. Always feels good to have a new ham on board or an upgrade. Thanks also for letting me participate. It's been a long time since I exercised my credentials. Thanks to W3AOK for breakfast!!! Looking ahead we have Field Day right around the corner as well as the MS150 and other projects so stay tuned for further announcements.

If anyone has any suggestions for a speaker or would like to speak at one of our meetings please let any of the club officers or board members know. Your input is vital and we welcome all suggestions.

See you all at the next meeting

73, Greg WA3GM

***Phil-Mont Birthdays
& Tidbytes***



April Birthdays

05 Rob Moore – N2RM
06 Andrew Furlong KC2PMW
08 Jackie Chedeville (XYL W3GQD)

12 Larry Bennett - NJ3Z
15 Mai-Lin (XYL N3BKR)
16 Janet Souza - KV4ZM

20 Harrison W. Gift-K3HWG
21 Michael Vincent N3TOX
22 Susan Hoch (XYL W3UI)

28 Gwen Patton - NG3P
30 Al Kaufmann - K3ZMJ

MEMBERSHIP STATS

At press time P.M.R.C. had:
96 FULL PAID MEMBERS
11 FAMILY MEMBERS
1 YOUTH MEMBERS
1 HONORARY MEMBER
1 Pending

***The March Saturday VE session
yielded 5 candidates resulting in 3
new tech and 2 general tickets.***

Bravo VE team!

***The VE Thursday evening session is on
the 23rd this month.***

As always, many thanks to our VE team!

From the Secretary

General Meeting 3/11/2015

WA3GM opened the meeting at 7:30 PM. There were 7 visitors and 29 Members as of meeting opening. (I am told more came in but did not sign in.)

Two new members were announced AB3WD & K3RON. WELCOME!

Pat W3HVG submitted an application for membership. Pat runs the net for Philadelphia RACES.

There are 2 fusion radios for loan the HT went to W2GTV the Mobile rig is available.

WA3DSP mentioned the Archives are up to 2200 photos scanned and 6.5 gig of DATA (documents).

KB3CZE Griffin Spoke about the project at Abington High School. They are looking for HF gear and some HT's as well as antennas. Two 2M verticals and an HF wire were donated when needed by WU3I.

WA3GM introduced Sal NC3U who gave an interesting Program on Digital Fusion.

Respectfully submitted, Steve, WU3I

Weak Signal Modes - Digital Education Net (the DEN)

So far I have discussed how sound cards (internal chips or external usb) can be coupled to your HF SSB or VHF/UHF FM radio to explore the magic world of digital keyboard modes. Digital modes come in many flavors, much like the variety of instruments in an orchestra. Each mode has its own pros/cons as seen on the HF bands and VHF repeaters. CW, the first digital mode (emission type A1A) is easy to transmit and copy, either by ear, or copy by software such as FLDIGI, Ham Radio Deluxe, and others. Radio Teletype (RTTY) has been popular for decades and is still used extensively for casual chats as well as contests. RTTY is a form of frequency modulation (F1B) where the digital zeros and ones in the Baudot code are present in one of two possible radio frequencies, still referred to as “mark” and “space”. PSK31 (or BPSK31) has rapidly become the “chat” mode of choice on the HF bands due to its ease of copy, narrow bandwidth, and superior insulation from QRM and atmospheric noise.

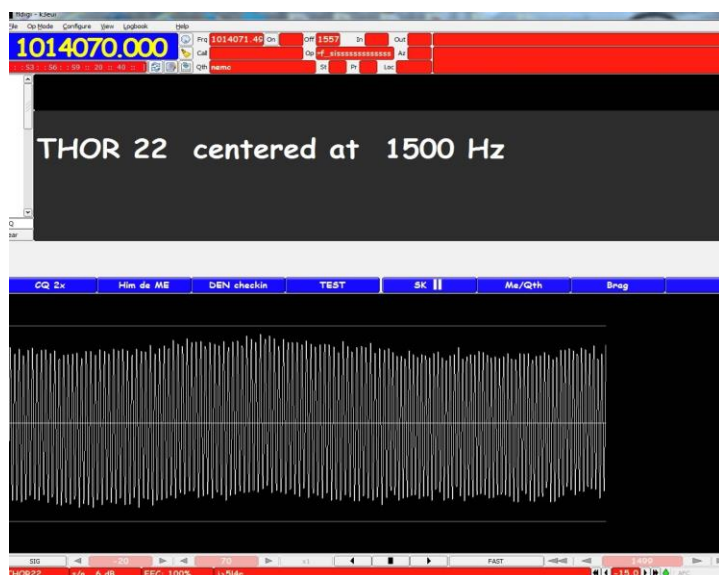
Weak Signal Modes When you want to work DX, or low-signal level QSO's, the HF modes of choice are **Olivia**, **MFSK**, and **JT65**. They all copy when received signals are 10 dB or more below the average noise level on your HF receiver. Olivia and MFSK modes are popular now on the 40 meter PA, NJ, and NY NBEMS nets, appearing on 40 meters around 7073 kHz (Sunday) and 7036 kHz (Saturday). **JT65** carries copy of low signal levels to an extreme, allowing you to work stations that are 20 dB or more below the noise level. JT65 has been picking up in popularity due to its free software (WSJT-X) and excellent help menus from its author, Joe Taylor himself, a retired Physics professor and Nobel prize winner from Princeton University. Listen for JT65 on 7.076 MHz and 14.076 MHz (upper sideband) any time of day or night and hear stations from all over the world transmitting with 1 – 10 watts of RF and simple antennas. Last week I worked Australia just before dawn on 7076 kHz using JT65 with one watt output power and a

homemade vertical antenna made from 36 feet of aluminum tubing tied to a tree and two above ground 34 foot radials.

THOR THOR 22 is the mode that we have been using the last few weeks on the digital educational net (DEN). First, I love the name, THOR, and more so, I enjoy the sounds of THOR. The sounds are simple sine waves, transmitted one at a time, in rapid succession, much like a carnival calliope. What are the advantages of THOR?

First, THOR is a mode that employs “**forward error correction**” (known as FEC) which allows some redundancy in the transmission of signals, resulting in almost perfect copy of the information. THOR is not a “handshaking mode” like Packet, AMTOR, and PACTOR, but THOR does have excellent throughput at moderate speeds. THOR is a frequency modulation emission (F1B): that is, the tones that represent characters have a constant amplitude, but vary in pitch or frequency. THOR also has multiple speeds, from the very slow THOR 4 at 4 baud and 4 wpm to the speedy THOR 100 at 97 baud and 352 wpm. THOR is very easy to tune in and is resistant to radio or sound card drift in frequency, as THOR uses a novel method of demodulation called “**incremental frequency shift**” (IFK) in which the software measures the CHANGE in frequency (pitch) from one tone to the next tone, rather than the absolute pitch of any given tone. Thus, you can mistune a THOR signal by 100 Hz on the waterfall and still get perfect copy. THOR is therefore a great mode for beginners and older transceivers.

Here is a screen shot of THOR 22 taken with FLDIGI's SIG display (much like an oscilloscope trace). The AMPLITUDE of the tone is plotted on the Y axis and TIME is plotted on the X axis. Note that THOR is a modulation mode of almost constant amplitude, making it easier to amplify in FM radios.



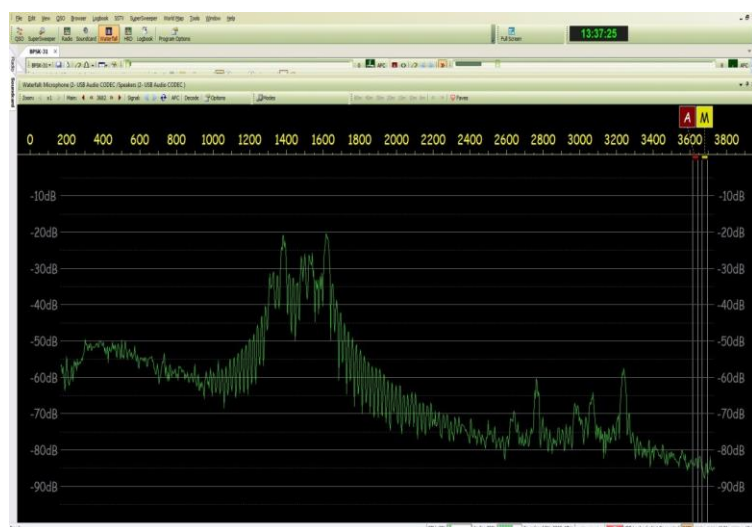
The last screen shot taken with Ham Radio Deluxe shows a frequency spectrum plot (FFT) of THOR 22 as seen on an FM radio simplex frequency. Note that the tones exist on certain frequencies, but are sent one tone at a time. We usually center at 1500 Hz on the waterfall when possible, to avoid the very low bass and very high treble audio frequencies in our radios. Like all modes, be careful to adjust the audio levels so as to not overdrive the modulation (which causes clipping and harmonics).

and K3EUI on the Digital Education Net (DEN) Tuesday evenings at 7 – 9 pm on 147.030 + PL 91 Hz.

Barry Feerman, K3EUI

Bill Clayton K3HIE, SK

Of Cumru Township Passed away peacefully on January 11th 2015 at the Reading Hospital and Medical center. He was a WWII veteran who served as Signaller First Class and a member of the Reading QCWA and Philmont. Full obituary can be found in the *Reading Eagle* dated January 14th.



Next meeting topic is mobile installations by Mike KB1JEY. Everyone should benefit from this as mobiles are everywhere so don't miss it!

In the next article in this series on FLDIGI and sound card modes, I will explore JT65 in more detail. If you have questions, or want to discuss sound card modes in general, please join W3STW

TENTEC/YOUKITS SWR ANALYZER

A User Report

Bob Thomas, W3NE

Standing Wave Ratio (SWR), or more accurately VSWR (Voltage SWR), has become nearly an obsession with some hams. It wasn't always like that; before WW-II almost no amateurs concerned themselves about SWR – or even knew what it was in many instances. That was because the transmitter-to-antenna feeds were usually made with open wire transmission lines that frequently, and intentionally, operated at a high SWR to properly match the antenna to low impedance link coupling in the transmitter. Transmission lines actually performed the function of an antenna tuner in many respects. Furthermore, tube-type transmitters do not disintegrate if they feed a screwball impedance in the way solid state rigs used to until they included internal protection circuits that progressively reduce power when the SWR is more than about 3:1.

There was another reason SWR was inconsequential before the war: coaxial cable, as we know it today, didn't exist! One of the good things that came out of WW-II was flexible coax made with a dense polymer compound for the dielectric and a protective outer sheath. The advantages of coaxial transmission lines in certain situations was certainly well known by hams before the war but the only way they could obtain coax was to buy a kit and make their own!



Coax kits typically consisted of a piece of bus wire ten feet long, a similar length of copper braid, and a bag full of polystyrene beads. Beads were strung on the bus wire then the braid was (somehow) stretched over them. The beads were convex on one end and concave on the other, so when they were strung along the bus wire they fitted closely together with a joint that allowed them to flex slightly when the assembled cable was bent in a curve. If you wanted thirty feet of coaxial cable, you assembled three kits and soldered them together at their ends. Not many hams made their own coax!

The war surplus market was flooded with RG-8/U and a few other types of coax after the war. In the intervening years manufacturing methods have been refined, new materials developed, and a plethora of types introduced to meet special needs. Whereas SWR was generally inconsequential in the old days, it has become an item of concern where coax is used, especially for VHF.

Aside from the detrimental effects of high SWR on solid state transmitters, it causes a loss within the coax dielectric that degrades efficiency of the system on both transmission and reception. For example, on ten meters 100 feet of RG-8U will introduce a loss of 1.04 dB if the SWR is 3:1. If the transmitter is putting out 100 Watts, less than 80 Watts gets to the antenna! The same conditions on 2 meters would result in only 60 Watts into the antenna from a 100 Watt transmitter. For RG-8X miniature coax, corresponding conditions would result in about the same loss on 10M but only 30 Watts into the antenna on 2M. Even LMR-400 would transfer only 60 Watts to the antenna at 3:1 SWR on 2M. So maybe there is a reason for an obsession over SWR.

The simplest device for measuring the SWR in a coax transmission line is the Coax Twin-Lamp described in a 1948 QST.¹ In the clever construction described in the article two lamps are connected to a sensing loop buried in groove cut in the coax dielectric. One lamp lights brilliantly depending on forward power from the transmitter while the intensity of the other lamp depends on reflected power. The need for home made SWR indicators

diminished over the years as economical commercial equipment entered the market. The “Gold Standard” for measurement of VSWR is the Bird Technologies Model 43, an expensive but accurate instrument that requires equally costly plug-in “slugs” to adapt the basic meter for various power levels and frequencies. However, many other instruments suitable for amateur use are available at reasonable prices.

The devices mentioned so far are intended for in-line use with a transmitter. But what if you are adjusting an antenna and need instantaneous SWR readings? A number of instruments have been available for that application, including the Autek Laboratories Model VA1 Vector Analyst. It is a compact self-contained instrument with a built-in 800 kHz to 35 MHz signal generator. It measures SWR, impedance, and both series and parallel resistance and reactance. It has been indispensable at W3NE for adjustment of conventional antennas but became virtually useless when a dipole made of two independently-tuned screwdriver antennas was recently put in service. Tuning one side of the dipole affects the tuning of the other side, making it almost impossible to arrive at the correct adjustment of both loading coils for minimum SWR.

Not to worry though – problem solved! Enter the FG-01A Antenna Analyzer, imported by YouKits and marketed by that company and TenTec. Despite the inference from the importers name, the FG-01A is not a kit; it is fully assembled with an internal lithium battery. Its rugged die cast case is only 4” high and 2” wide. RF connection is through a BNC receptacle. The upper two-thirds of its high resolution four-color LCD display is a graphical sweep presentation of SWR and impedance versus frequency over a selectable bandwidth. The lower third of the display lists setup parameters and the numerical values of measured SWR and impedance; it also displays selected Memory Numbers and battery voltage.

A DDS VFO in the FG-01 has a frequency range of 1 to 35 Mhz. in selectable steps 1 kHz to 1 MHz. Step increments and all other setup parameters are selected and stored with a single “Soft Knob” on the shaft of a rotary encoder. Pressing the Soft Knob

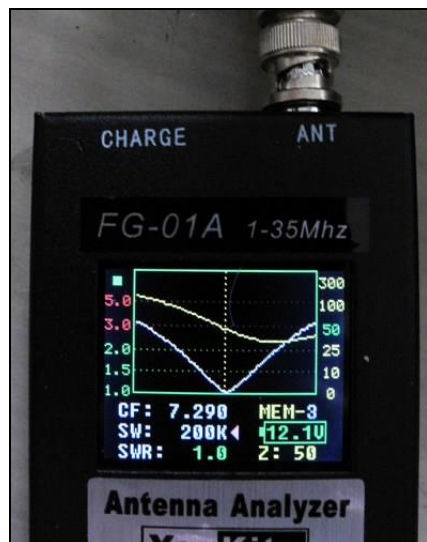
selects the next parameter it will control. Operating modes, chosen by successively pressing the Soft Knob, cycle through the following sequence: Center Frequency (adjustable to 1 kHz), Sweep Width (adjustable from 0 for constant frequency to 20 MHz), and Memory Number (0 to 9). Each memory stores all parameters and the sweep display.



Operation of the Soft Knob is guided by a small pointer icon and by the color of individual digits it will control. Adjustment is more-or-less intuitive so it doesn't take long to set parameters for an optimal sweep display.

The FG-01A has made interacting adjustments of the two screwdriver antennas a routine operation. For a major QSY the SWR null is first set to the new operating frequency, which has been previously set at the center of the sweep display. Minor blips to the tuning motors of antennas on each half of the dipole then trim the shape of the SWR curve for best symmetry while simultaneously bringing the impedance close to 50 Ohms. That entire process takes less time than it does to slew the antennas from one band to another. Calibration marks on the graphical display show the 2:1 and 3:1 SWR bandwidths of the final setting as a useful indication of how far a QSY can be made without the need to re-tune the antenna. In the W3NE setup, switching between normal operation and SWR

measurement is accomplished rapidly with an RF Control Center, but that's a story for another time.



The YouKits FG-01A and three other SWR analyzers were reviewed a few years ago in *QST*.¹ More recently MFJ has introduced their new Model 225 SWR Analyzer with a frequency range up to 180 MHz and capability to transfer data to a PC. It is priced \$100 higher than the FG-01A but if substantial measurements are anticipated on six- and two-meters it might be a better choice. In any case TenTec/YouKits and latest MFJ product introductions point to a new era in SWR measurement. The FG-01A has become an essential asset at W3NE, where it has turned an impossibly complex antenna adjustment process into a simple, routine exercise.

REFERENCES

¹ Keay, O.S., W0SJK, "The "Coax Twin Lamp." *QST*, 25-26. November 1948.

² Hallas, Joel R., "A Look at Four Antenna Analyzers." *QST*, 46-52. March 2012.

Here's an email reminder from the ARRL about the April QST:



Product Review

We go in-depth with reviews of the FlexRadio FLEX-6300 and 6700 software defined transceivers. Read the reviews and then watch the videos! - page 47

It Seems to Us

ARRL CEO Dave Sumner, K1ZZ, takes up the controversial topic of remote operating. - page 9

Voltage Reducer for Lithium-ion Polymer Four-Cell Batteries

Author Phil Salas, AD5X, shows you how to use Lithium-ion Polymer batteries to power your equipment. - page 39

The Doctor is In

You'll discover that vertical antennas aren't always omnidirectional. - page 59

Go online and start reading this issue, [now!](#)

April at Phil-Mont

1 Wed Board Meeting
 April Fools Day
 3 Fri Passover begins at Sundown
 5 Sun WA3GM
 Easter Sunday
 8 Wed General Meeting
 12 Sun NC3U
 15 Tax Day
 19 Sun KB3IV
 23 Thur VE Session
 26 Sun K3XS

***Note the New net -
 9:00PM Tuesday night on
 29.493MHz AM mode***

***Don't forget the ARES net on Sunday nights and
 the Digital net on Tuesday nights.***

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For Sale

***1/8" (290#) & 3/16" (380#) Dark Olive
 Drab Braided Cord · 100%
 Polyester/Dacron Knit Braided. Nice stuff!
 Tough and long lasting · UV Resistant and
 Low Stretch Proudly Made in the U.S.A.!***
***Contact Steve WU3I at wu3i@arrl.net or
 215-605-6074***

**YAESU FTdx-5000D w/SM-500
 STATION MONITOR**

In excellent shape with all original accessories and paperwork (including receipt) that came with radio and original boxes. Asking \$4,100.00

Also:

ICOM IC-746PRO Comes with stock mic, SP-21 matching speaker, and matching PS-23 power supply.

In excellent shape. Asking \$1,100.00

Contact email: ralfygee@gmail.com

de Ralph K3FXR

First Class Mail

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The Blurb